

Attempt in all Questions and assume any missing data

Q1: 10 Marks

(a)-Line coding is a part of source coding, explain this phrase. (2 Marks)

(b)-For the **data** signal and **CLK** shown in **Figure (1)**, draw the following line coding waveforms: 1-UNI-RZ, 2-BIP-RZ, 3-UNI-NRZ, 4-BIP-NRZ, 5-Manchester, and 6-AMI. (4 Marks)

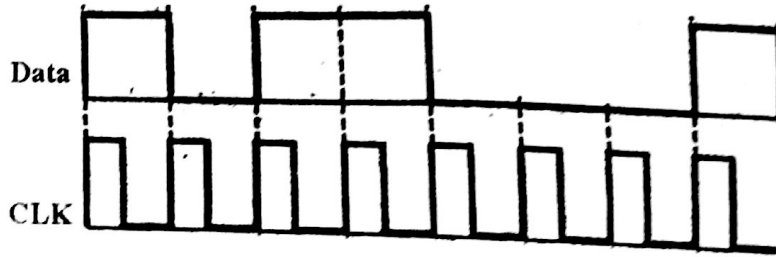


Figure (1)

(c)-Draw with explanation the circuit implementation of the following line coding waveforms: 1-UNI-NRZ, 2-BIP-NRZ, and 3-BIP-RZ. (4 Marks)

Q2: 10 Marks

(a)- Draw with explanation the general block diagram of **PCM** modulation circuits.

(b)-The circuit shown in the Figure (2) is a **PCM** modulation circuit. (5 Marks)

(b)-The circuit shown in the Figure (2) is used to implement a digital communication system, name this system and describes each components of this circuit. Write the equations of the gain and the cutoff frequency. (5 Marks)

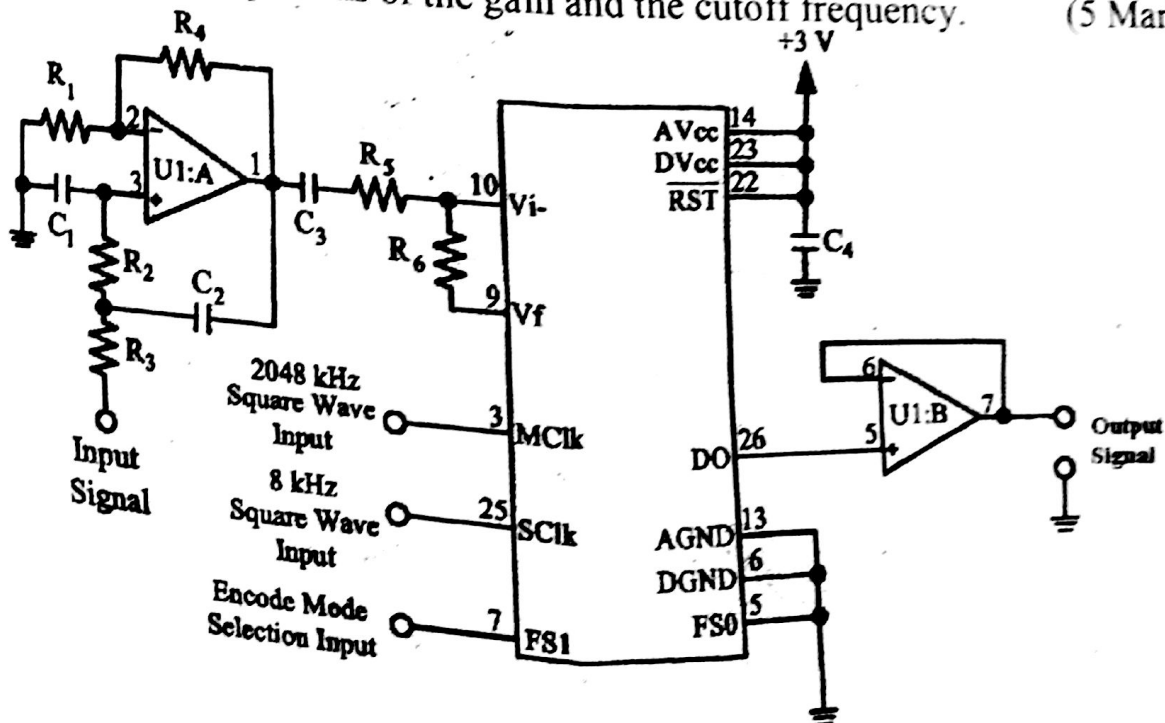


Figure (2)

Q3: 10 Marks

(a)-For the data signal shown in Figure (3), draw with explanation the modulated signal obtained from the following modulation systems: (1)- ASK, 2- FSK, and 3- PSK. (4 Marks)

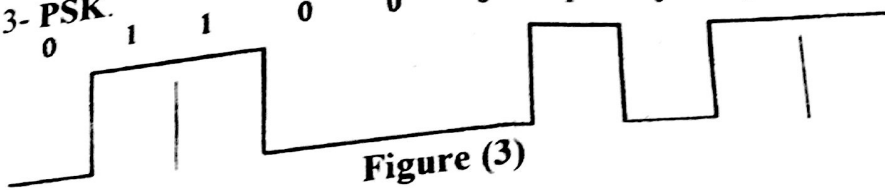


Figure (3)

(b)-Draw with explanation the block diagram of ASK modulation circuit by using a balanced modulator. (2 Marks)

(c)-What kind of modulation has been done for modulated signal shown in Figure (4)? Name this modulation system and explain how to recover the original signal. (4 Marks)

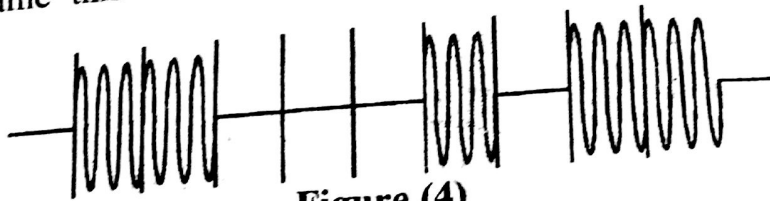


Figure (4)

Q4: 10 Marks

(a)-The circuit shown in Figure (5) is used to implement a digital communication system, name this system and describe each component for this circuit. (5 Marks)

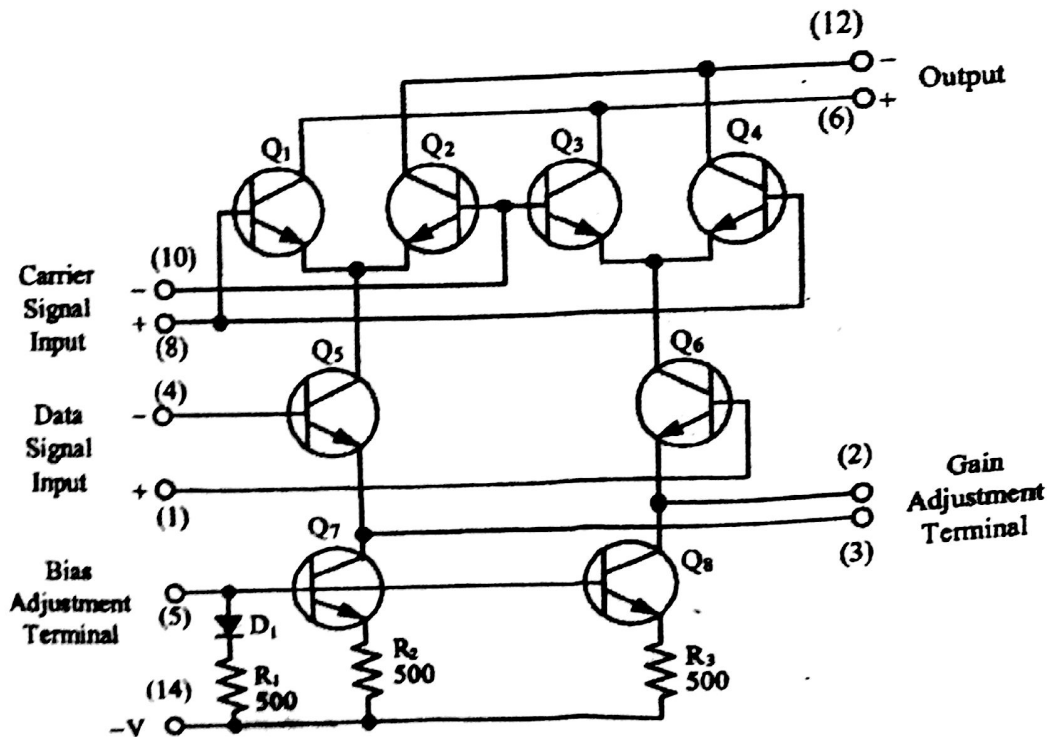


Figure (5)

(b)-Draw with explanation both the block and circuit diagram of the ASK asynchronous detector. (5 Marks)